

1 **CLAIMS**

2 What is claimed is:

3 1. A computer-implemented method for developing a reusable
4 electronic circuit design module, wherein the design module
5 is comprised of one or more functional design elements
6 comprising the design module, comprising:

7 entering the functional design elements into a
8 database;

9 entering documentation elements into the database;

10 linking the functional design elements with selected
11 ones of the documentation elements;

12 simulating a testbench with the design module, whereby
13 simulation results are generated;

14 storing the simulation results in the database; and

15 linking the simulation results with the functional
16 design elements.

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18 2. The method of claim 1, further comprising:

19 translating the functional design elements into a
20 netlist; and

21 linking elements of the netlist with selected ones of
22 the functional design elements.

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24 3. The method of claim 2, further comprising:

25 translating the functional design elements into a
26 physical implementation; and

27 linking elements of the physical implementation with
28 selected ones of the functional design elements.

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30 4. The method of claim 1, further comprising:

31 entering simulation elements in the database; and

32 linking the simulation elements to associated ones of
33 the design elements.

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35 5. The method of claim 4, further comprising:

1 entering documentation for a design script in the
2 database; and
3 linking the documentation of the design script to the
4 design elements comprising the design module.

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6 6. The method of claim 4, further comprising:
7 entering documentation for the simulation elements in
8 the database; and
9 linking the documentation for the simulation elements
10 with associated ones of the simulation elements.

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12 7. The method of claim 6, further comprising:
13 inspecting the functional design elements and
14 simulation elements for associated documentation; and
15 reporting documentation deficiencies in association
16 with the functional design elements and simulation design
17 elements.

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19 8. The method of claim 1, further comprising:
20 inspecting the functional design elements for
21 associated documentation; and
22 reporting documentation deficiencies in association
23 with the functional design elements.

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25 9. The method of claim 1, further comprising:
26 inspecting the functional design elements for
27 undesirable design characteristics; and
28 reporting the undesirable design characteristics found
29 in the functional design elements.

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31 10. The method of claim 9, further comprising:
32 inspecting the functional design elements for
33 undesirable hierarchical characteristics; and
34 reporting discovered ones of the undesirable
35 hierarchical characteristics.

1 11. The method of claim 9, further comprising:
2 inspecting the functional design elements for adherence
3 to predefined design rules; and
4 reporting violations of the design rules.
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6 12. The method of claim 11, further comprising providing
7 assistance in specifying the design rules for the functional
8 design elements.
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10 13. The method of claim 9, further comprising:
11 monitoring changes made to the functional design
12 elements; and
13 indicating which of the functional design elements are
14 dependent on the changes.
15

16 14. The method of claim 1, further comprising:
17 translating the functional design elements into a
18 physical implementation; and
19 linking elements of the physical implementation with
20 selected ones of the functional design elements.
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22 15. The method of claim 1, further comprising requiring
23 specification of parameters at a top level of a hierarchy of
24 the design module.
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26 16. The method of claim 1, further comprising displaying
27 the functional design elements linked to errors in the
28 simulation results.
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30 17. The method of claim 16, further comprising displaying
31 documentation elements associated with errors in the
32 simulation results.
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34 18. An apparatus for developing a reusable electronic
35 circuit design module, wherein the design module is

1 comprised of one or more functional design elements
2 comprising the design module, comprising:
3 means for entering the functional design elements into
4 a database;
5 means for entering documentation elements into the
6 database;
7 means for linking the functional design elements with
8 selected ones of the documentation elements;
9 means for simulating a testbench with the design
10 module, whereby simulation results are generated;
11 means for storing the simulation results in the
12 database; and
13 means for linking the simulation results with the
14 functional design elements.

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16 19. A system for developing a reusable electronic circuit
17 design module, wherein the design module is comprised of one
18 or more functional design elements comprising the design
19 module, comprising:

20 a database arranged for storage of the design elements
21 and documentation elements;

22 a design inspector coupled to the database, the design
23 inspector configured and arranged to link the functional
24 design elements with selected ones of the documentation
25 elements;

26 a debugging-support module coupled to the simulator and
27 to the database, the debugging-support module configured and
28 arranged to generate a netlist from the design module,
29 wherein the netlist is suitable for simulation;

30 a functional simulator coupled to the debugging-support
31 module, the simulator configured and arranged to simulate a
32 testbench with the design module, whereby simulation results
33 are generated; and

34 wherein the debugging-support module is further
35 configured and arranged to store the simulation results in

- [illegible]